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Are You Buying a Washing Machine?

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Are You Buying a Washing Machine?

The following points should be considered in the selection of a washing machine:

Reliability of Manufacturer and Dealer.—It is best to choose a washing machine manufactured and sold by firms which are reliable and which have been in business long enough to have established a reputation for quality merchandise and service. The retail dealer should be one who is able to give service and replace parts without delay. All repair and replacement work should be done by local companies authorized to service a certain make (or makes) of machines. These authorized companies will use replacement parts manufactured by the firm making the washing machine, rather than parts which are made by other firms and which may or may not fit a particular machine. Expert workmanship is just as important in servicing a machine as in constructing it.

Guarantee.—Upon the reliability of the dealer and the manufacturer depends the real worth of any guarantee. It is advisable to determine what service is really available in accordance with this. Most manufacturers of washing machines guarantee their product on the basis that any repair or replacement service needed within the first year after purchase of the machine will be given without additional expense to the owner.

Safety.—It is advisable that the washing machine selected be listed as having been approved by the National Board of Fire Underwriters. Products so listed are not necessarily the same in quality, but such listing indicates compliance with the Underwriters' Laboratories' requirements for safety.

All moving parts of the washing machine should be fully enclosed to eliminate any possibility of damage to the machine, or of injury to the operator or to children.

The motor should be so located under the machine that water splashed from the tub will not fall on it, and should be insulated from the metal part of the machine so that the operator is protected from electric shock in case a short circuit in the motor occurs. Such insulation, however, has its limitations. In the course of time it may deteriorate, and in so doing, may permit a live conductor to come in contact with the metal frame of the machine. For this reason, at the time a machine is installed, the metal frame should be properly grounded with a good electrical connection to the earth. With this arrangement, should a short circuit develop, the excessive current will be carried directly to the earth instead of through the body of the operator. Without proper grounding and under certain conditions of contact, the current would flow through the operator's body and might cause serious injury.

If the washing machine is equipped with a wringer, its placement should be such that the machine is well balanced and will not tip. The wringer should have a hand-controlled safety release which is easy to operate with one hand, and so located that it can be reached with equal ease from either side of the machine.

Washing machines equipped with centrifugal dryers should be so constructed that there is no possibility of the hand being caught in the dryer when the basket is revolving.

The cord connecting the electric washing machine with the supply current should have a rubber outside covering. Any insulation which becomes water-soaked is ineffective. Therefore, the use of rubber covered cords in the laundry will eliminate some of the hazards encountered in the use of electricity. Any opening in the frame of the washer through which the cord passes should be provided with smooth insulated bushings to prevent excessive wear on the cord. Outlet plugs of rubber will break less easily than those constructed of composition material, and for this reason are more satisfactory and safe.

Initial Cost.—The initial cost of modern washing machines varies from $25 to $165. Prices vary according to size and type of machine, material and finish used in tub and frame construction, type and construction of water removal device, presence or absence of draining pump, type of power, and other special features.

Washing machines equipped with individual gasoline engines cost approximately $30 more than those having electric motors. The addition of a motor driven pump to a washing machine increases the initial cost about $10, while a washing machine equipped with a centrifugal dryer costs approximately $30 more than the same model washer equipped with a power wringer.

The Financing of the Purchase.—The lead pencil is an important tool in household operation; the purchase of equipment is one of the places to use it. Equipment may be purchased in any one of several ways. The simplest and in many ways the most satisfactory method is to pay cash — if possible without borrowing. If one does pay cash, try to get "discount for cash." If one does not have the cash:

1. The dealer may furnish the credit.

a. On open account. He may charge interest or may not. Oddly enough, some dealers let one pay for the goods 3 months or 6 months later at no higher charge than if the deal were for cash.

b. On installments. One pays part in cash, the balance at so much a month. Usually this balance is figured so as to give the dealer an interest rate of 12 to 24 or more per cent per year. If paid within 90 days often no added charge for interest is made.

2. To get the cash, one may have to borrow.

a. Borrowing may be from a commercial bank, on one's personal note at 6 or 7 per cent.

b. The farmer may borrow from his Production Credit Association at 5 per cent per year, plus costs of placing the loan, on the security of a mortgage on livestock and machinery. This mortgage does not touch auto or household goods.

c. The private finance or chattel loan company lends on chattel mortgage security, often including household goods and auto, at rates from 12 per cent to 36 per cent per year. These loans are generally payable in monthly installments utterly unsuited to most farm incomes. Some companies lend without chattel mortgage security, but require two co-signers on the note.

For a better understanding of some of these terms of purchase, Ohio Agricultural Extension Bulletin 161, *How Easy are Easy Payments*, by B. A. Wallace, will be found helpful.

Cost of Operation.—The cost of operating washing machines varies principally with the size of machine, the amount and kind of washing done, the type of fuel used, and the efficiency in operation.

Most electric washing machines are driven by motors having one-fourth or one-sixth horsepower. Such motors consume very little electricity when in operation, and thus the use of an electrically operated washing machine does not add much to the monthly electric bill.

The average wattage of electrically operated washing machines is 500. The average kilowatt hour consumption is 24 per year.[1] This would be 2 kilowatt hours per month. At a rate of 5 cents per kilowatt hour, the operating cost would be 10 cents per month.

Cost of Installation.—At the present time most washing machines are installed in the home at no additional cost to the consumer. If the machine is to be operated by electricity, it is generally connected to a convenience outlet already in the house wiring circuits. It would be desirable, however, to have all electric washing machines, as well as all other power equipment, connected to power circuits separate from those for house lighting. Overloads on the lighting circuits would thus be eliminated, and the operation of the washing machine would not interfere with the operation of other household devices.

If a ground wire is not incorporated in the circuit to which the washing machine is to be connected, a separate additional conductor which has been grounded with complete connections to the earth should be securely and permanently fastened to the frame of the washing machine. Protection from electric shock and burns is obtained through proper protective insulation, incorporated in the construction of the washing machine in conjunction with adequate and correct grounding.

If a new power circuit is installed in the house, the cost for installation is usually between $5 and $20, the difference depending on existing house wiring and desired location for the machine.

Installation of washing machines operated by gasoline engines, attached to the washer frame, seldom involves any cost if there is a satisfactory, safe, and available location for the engine exhaust. If such a condition does not exist, the cost for installing a gasoline power washing machine would vary with the amount of labor involved in making provision for a noiseless and safe exhaust outlet. The ideal treatment for any gasoline engine exhaust is to carry the pipe through an opening in the outside wall of the house and to place the exhaust outlet in a sufficiently large hole in the ground. Under such conditions harmful gases, produced during operation of the machine, will be carried off into the air and the noise developed so muffled that there will be a minimum of annoyance.

Cost of Upkeep.—Regardless of how well a machine is designed and constructed, there may be a time when repairs and adjustments are necessary. Whether the amount of servicing is large or small depends to a very large extent upon the care given the machine during use and storage. The machine will give greater satisfaction, will have longer life, and will require less servicing and expense if given proper attention. Care should be exercised regarding: (1) load-

[1] The Electric Light and Power Industry in 1934. Edison Electric Institute, Statistical Bulletin No. 2. Chicago, Illinois. April, 1935.

ing the tub during washing processes; (2) use and loading of the wringer or centrifugal dryer; (3) thorough draining, adequate cleaning, and proper drying; (4) condition under which the machine is stored when not in use; and (5) regularity in the lubrication of the motor and gears.

Unless adequate care is given, washing machine motors and gears, which have to be lubricated every few months, will require more frequent servicing and will wear out more rapidly than those needing less frequent lubrication.

The mechanism of the electric washing machine may be either belt driven or gear driven, while washing machines controlled by gasoline power are generally belt driven. Belt driven machines may require more frequent servicing than gear driven mechanisms, but the average expense incurred is usually much less, since there is very little labor involved which cannot be taken care of by the householder.

Size.—The size of the washing machine to be selected is usually determined by the size of the family and its washing needs. Capacity of washing machines should be designated by pounds of washing load rather than by the heretofore customary "sheet" load. Sheets vary so much in size, weight, and quality of material that their use as a basis for optimum washing machine loads should be discontinued.

The majority of washing machines on the market today are approximately of the 6- or 7-pound capacity size. This size seems to fill most conditions requisite to the washing needs of the average or greater than average size family. For the smaller family there are washing machines having optimum loads of 3 and 4 pounds. However, the apartment or portable washers, as such small sizes are called, are not to be recommended even for the family of two if all the washing is done in the home, unless there is such a space limitation as to prohibit the storage and use of a larger one.

For the very large family there are washing machines having a 9- or 10-pound capacity load. Many manufacturers make a double tub washing machine, which has an agitating device in each tub and which is ideal for the large family. The double tub washer is convenient as a time and labor saver, but is higher in initial cost.

If working room is at a premium and if storage space is limited, a washer occupying only a small floor area will be more desirable than one requiring greater floor space. Washing machines equipped with wringers or those having the dryer arrangement within the tub occupy less floor space than those having the dryer in a separate outside compartment.

In order to determine which size is best suited to a particular family's needs, it is desirable for the prospective purchaser to use the washing machine in the home and under normal washing conditions.

Type of Operation.—More than three-fourths of the washing machines manufactured at the present time are of the type known by the general term, *agitator* (or gyrator). This first named type has a paddle-like agitating device whose shaft is in a vertical position in the center of the tub. This device turns back and forth and *swishes the clothes through the water.* In this type, the paddles (or part extending from central shaft) start from the bottom of the tub and may be straight, curved, or in the form of a spiral. The washing action

is from the bottom of the tub, and may or may not extend up to the surface of the water, depending upon difference in construction, design, shape, and size of the agitator.

The second type is known as the *dolly* principle of agitation, which is similar to the gyrator type in that it is centrally located in the tub and has paddles. The difference is that, in the dolly type of machines, the agitating device is located at the top of the central shaft and that the paddles extend down into the water when the tub is filled.

The third type, known as the *suction* or vacuum cup principle of agitation, produces a washing action by means of one or more suction cups attached at the top of a vertical shaft centrally located. The vacuum cups in most of the washing machines of this type move in a horizontal direction as well as up and down. This principle of agitation *forces water through the clothes*, by means of suction. In most washing machines of the latter two types, the agitating device has to be removed when loading and unloading the tub.

In the *cylinder* and *oscilating* types of washing machines, the clothes are placed in cylinders or baskets, and are rocked back and forth or in a figure 8 motion when the machine is in operation. Machines of these two types are quite bulky, difficult to drain and dry thoroughly, but, because of the type of action, are said to be easier on the clothes. Few manufacturers are constructing washing machines of this type, however.

The wearing out of articles in laundering is often attributed to the action of the machine. Any wear of the fabric in the washing machine is due primarily to incorrect placement of the clothes or to washing for too long a period. There is an optimum load for every machine. If the tub is underloaded, the washing will take less time, since each article will get greater agitation. If the machine is overloaded, the action will be sluggish, the load may be too much for the motor to carry and the machine will operate inefficientl.y It is always advisable to fill the tub to its correct capacity at each loading.

The type of fabric and the degree to which it is soiled determine the length of time that an article should be washed if the tub is correctly loaded with water and fabric.

Water Remover.—Washing machines may be purchased equipped with wringers, centrifugal dryers, or pressure extractors. The prospective purchaser should determine, by actual trial, which type of water remover will give the greatest amount of satisfaction under particular home conditions. For instance, if the machine is to be used in connection with stationary laundry tubs, the convenience for extracting water from the clothes should be considered. If storage space is limited, a washing machine with a wringer or a centrifugal dryer inside the tub may be of greater convenience than one of another construction.

If much bedding and heavy linen are washed in the home, such articles will be more fluffy and less wrinkled if the water is extracted from them by means of centrifugal dryers or pressure extractors than by power wringers.

The wringer on a washing machine should be sturdy and rigid in construction and all parts which may come in contact with the wet clothes should be rust resistant. There should be a safety device which can be operated with one hand. This safety release should decrease the pressure on the rolls and separate them

so that, should the hands or clothing be caught between the rolls, they can be removed instantly. Wringer rolls which are geared so that the rolls will no longer revolve when the pressure is released are safer than those which continue to revolve, and for this reason are preferable.

Wringers should lock in at least four positions to be convenient when used in conjunction with laundry tubs. Wringers which have automatic arrangements for controlling the direction of the water being removed from the clothes are more convenient and less trouble to use than those which are adjusted by hand.

The tension on some present day wringers may be adjusted by hand. On others there is no tension adjustment. To take care of different thicknesses of fabric, the distance between the rolls is adjusted automatically by a spring.

The wringer should have enclosed gears to prevent contact with clothes, and ball bearings to permit easy and even movement of the rolls. Some manufacturers use soft or semi-soft rubber in the construction of wringer rolls. Such wringer rolls have a more gentle action on clothes, buttons and snaps, than do those made of harder rubber.

The drain boards on a wringer help to control the movement of the clothes to and from the rolls, and should be sufficiently wide to take care of any width of clothing which would be put through the wringer. It is desirable that the corners be rounded and smooth so that clothing will glide easily over the surface. The drain board should be deep enough to drain off thoroughly all water removed, yet should not be so deep that it would catch and hold the clothing being put through the rolls.

Centrifugal dryers force the water from the clothes by whirling or spinning them in specially designed baskets. The dryer basket may be in the tub in which the clothes are washed, or may be in a separate compartment outside the washing tub. The use of a washing machine equipped with the dryer basket outside the washing tub saves time in that one load may be rinsed and dried while another load is being washed. Such procedure is impossible with a machine having the dryer basket inside the washing compartment.

Dryer baskets which are in compartments outside the washer tub get rid of the water removed from the clothes in one of two ways. One arrangement draws the water out through the bottom of the compartment by means of a pump. The hose on this type should be sufficiently long so that the nozzle end can be placed over the rim of the laundry tubs which are to be used with the washing machine. The other construction is a cone-shaped basket which, when spinning, throws the water upwards and out over a drainboard spout. With this construction the position of the spout can be changed so that the water being extracted will be returned to the correct tub. Easy and convenient movement of the spout over stationary laundry tubs which are to be used with the washer should be possible, if a washing machine equipped with this type of dryer is being considered.

In centrifugal dryers within the washing machine tub, the water from the clothes is forced through perforations in the dryer basket and falls back into the tub.

All parts of a centrifugal dryer which come in contact with the clothes should be rustproof and free from sharp edges. The basket should be easy to

remove to facilitate cleaning and drying and should be large enough to hold a full load of washed clothes.

Power.—In general, most of the washing machines purchased at the present time are operated by either electric or gasoline power. Of course, there are still some washing machines propelled by water or by hand, but the number of such machines purchased in the last few years is very low.

Electrically operated washing machines may be purchased for use with alternating or direct current of 110 volts from commercial distribution lines; or with direct current of 32 volts or direct or alternating current of 110 volts generated by home plants. Usually any particular washing machine model can be purchased with a motor suitable for whatever kind of current is available. It should always be remembered that the direct current motor should be used only on lines supplying direct current, and that the alternating current motor should be used only on lines carrying alternating current. It is also necessary to select a motor of the same rated voltage as that of the supply current. Thus, if a particular home plant has an electric pressure of 32 volts, the prospective purchaser should select a washing machine equipped with a 32-volt motor.

A washing machine equipped with a gasoline engine can be adapted to the use of electricity by substitution of an electric motor when electric service becomes available.

If a gasoline engine is already available in the home, a washing machine may be operated by means of a belt connected directly to the engine or to a line shaft. Smaller portable gasoline engines may also be connected to the washing machine by means of a belt drive. The washing machine which has the gasoline engine attached to its frame is much more convenient and easier to operate than one which has to be connected for use and detached for storage. Such connections make for less freedom of movement during the various washing processes. The engine exhaust pipe should be constructed of flexible piping if the engine is permanently attached to the machine. Such connecting pipe makes possible greater flexibility of movement of the machine during use and storage.

Overall Construction.—The *frame* of the washing machine should be constructed of tough, sturdy material. All structural parts should be sturdily built and held firmly and permanently together. It is preferable that all parts be welded and riveted together rather than connected by bolts. If bolts are used in construction they should be made of non-rusting material.

The tub on the washing machine should be seamless in construction, and made of a material and finish which will not rust, chip, crack or peel. The opening to the tub should be large enough to be convenient in loading the tub and when removing the clothes after the washing process has been completed.

The most common materials used in tub construction are cast or drawn aluminum, steel or iron finished with vitreous enamel or similar finishes. The least common materials are galvanized iron, monel metal, and copper finished with tin, chromium or nickel.

Aluminum tubs will not warp, crack, chip or rust. There is a possibility that aluminum tubs may pit. However, this may not occur until after many years of use. If the tub is not given regular and careful attention, aluminum discolors from alkalies and soaps. These products tend to accumulate in the form of a

crusty film about the tub. Tubs made of drawn aluminum have a smoother surface than those made from cast aluminum, but will dent more readily.

Lacquer or paint on the outside of the tub often chips off, thus exposing metal parts of the tub to water and air, and sometimes results in corrosion of these parts.

The most common material and finish used in the construction of the modern washing machine is sheet steel or cast iron finished with vitreous enamel. Vitreous enamel is rust resistant, easy to clean, durable if cared for properly, and is not affected by alkalies. Under average washing conditions vitreous enamel will not be affected by heat or cold and will not chip, crack, or peel. Tubs made of steel finished with vitreous enamel are usually seamless in construction, having a minimum of bolts and screw heads. Tubs finished in vitreous enamel are generally cushioned in rubber to prevent crazing and chipping of the enamel during operation, handling and moving.

Copper plated with nickel or chromium is usually used in combination with other metals such as aluminum or steel in the construction of washing machine tubs. Copper plated with nickel or chromium is light in weight, quite strong, durable, fairly easy to clean, and is rust resistant.

Monel metal tubs are durable, rust resistant, easy to clean, and are not affected by alkalies; but, on account of the high initial cost, their use is not very general.

The rim of the tub is often protected by a rubber or composition band or metal trimming. If a rubber band is used, it should be securely attached, and made of a material which is resistant to soaps and chemical washing compounds. The rim of a washing machine tub also may be reinforced with sheet aluminum, chromium, or monel metal. Each of these metals will prove satisfactory if put on so that there are no sharp edges likely to come in contact with the hands or clothing of the operator.

Legs.—The legs of the washing machine should be heavy and sturdy in construction, rigidly secured to the washer, and equipped with large, easy rolling, rustproof casters. Rubber tired casters are less noisy than those having metal, wood, or composition wheels, and will hold the machine more nearly steady while in operation. Maximum rigidity is secured if the leg framework extends to the top of the machine and if the legs are reinforced with braces. The leg braces should not interfere with draining, particularly if a bucket is to be used in the draining. If the washing machine is to be used on a floor which is not level, one of the casters should be equipped with a lock arrangement, which, when tightened, will keep the machine stationary.

It is desirable to have the legs adjustable in height so that the operator of the machine may stand in the most comfortable position.

Heat Retention.—Some washing machine manufacturers are constructing and selling their machines on the basis that heat retention is of prime importance. Such a feature would be a deciding factor in the selection of a washing machine if the washing processes extended over a period of several hours and if the same wash water were used for all washing loads. However, it is a proven fact that if the water in which the clothes are washed is too highly charged with dirt, there will be a re-distribution of dirt in the clothes, thus causing them to become yellow

and grimy. Under actual washing conditions more heat escapes during loading and unloading of the tub or because the cover does not fit snugly than is lost through the walls of the tub. In a study on washing machines carried on at the University of Nebraska in 1931, it was found that, "In no case was the cooling rate high enough to be of significance in the selection of a washing machine."[1]

Controls.—The controls for switches and gears on washing machines should be grouped together as much as possible, at a convenient height so that they may be reached without much stooping, and so located that they are easy to reach without moving around the machine from a normal working position. The controls should be easy to manipulate, easy to recognize for their particular uses, sturdy in construction, and so located that clothing of the operator will not catch on them.

Draining.—The drain opening in the tub should be ample to make possible rapid and complete drainage, should be easily accessible, and located in the lowest part of the tub. The bottom of the tub of a washing machine should slope toward the drain opening so that complete draining is made possible. It is advisable to see that the drain outlet is threaded to accommodate a standard size hose connection. Otherwise, a hose which will fit the connection should be supplied by the manufacturer or dealer. The control valve should be easy to open and close and clearly marked to indicate which adjustment will open and which will close the drain. The position of the drain should not interfere with the operator during the various washing processes.

Most washing machines at the present time may be purchased with motor-driven drain pumps. Pumps are necessary on most washing machines equipped with centrifugal dryers or pressure extractors, and are of great convenience on machines which are to be used in laundries not equipped with floor drains. If a machine does not drain well without a pump, no addition of a pump will make it do so. More rapid draining is possible, and less accumulation of lint causing drain stoppage is probable, with such pumps, but frequent service or replacement may be required to keep them in operating condition. Some pumps may be turned on and off by means of a separate pump control switch. Others operate whenever the motor of the washing machine is on.

Splashing.—The means by which water action is obtained should be of such shape, height, and size that under normal washing conditions with the machine loaded to capacity there will be no splashing when the tub is without a cover. Some manufacturers, knowing that the water agitation device does cause splashing when in operation, have constructed a splash rim around the top of the tub opening. Such construction may or may not be of advantage. Too often, when such a wide rim is incorporated on the machine, the tub opening is not large enough to be convenient when loading and unloading the tub. A drain board on a wringer which is automatically reversed when the direction of the rolls is changed is much more convenient than one operated by hand, and its use will result in less spillage of water.

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[1] "A Study of Washing Machines." Snyder, Edna B. and Bruneg, Morton P., Research Bul. No. 56. Agricultural Experiment Station, College of Agriculture, University of Nebraska, Lincoln, Nebraska. May 1931, p. 4.

The use of a hose on a washing machine drain outlet will eliminate excessive water spillage. Motor driven pump nozzles should revolve in position so that the nozzle may be placed in the best position in reference to the particular laundry drain and so that splashing during draining will be reduced to a minimum.

Quietness of Operation.—Most electric washing machines are practically noiseless in operation. Usually machines equipped with centrifugal dryers produce more noise and vibration than those using wringers for the extraction of water from the clothes. Much has been done recently, however, to make them less noisy in operation and in minimizing vibration. The use of rubber caster cups will lessen vibration and decrease the noise produced when machines equipped with centrifugal dryers are in operation. Vibration is due in some part to the incorrect loading of the dryer basket. The working element within the machine should not operate with a jerk. Such an action might be harmful to the mechanism as well as annoying to the operator.

Any washing machine operated by gasoline power in itself will not make any more noise than an electrically operated one, but the gasoline engine by which it is run makes considerable noise. If the engine exhaust is not taken care of satisfactorily, the noise which is produced when the engine is in operation will be very annoying.

A detachable cover when in position should fit tightly to prevent rattling or damage resulting from excessive vibration. Rubber tired casters which are tightly fastened will reduce noise during operation and moving.

Cover.—Washing machines having attached lids have an advantage over the machines with detachable covers, in that the attached lid when open affords a convenient shelf for clothes, is less likely to warp and become damaged in use, is more convenient to use and is less likely to become misplaced. An attached cover should be made of a heavy material and should be sturdily braced, tight fitting, convenient and easy to move, and conveniently placed in reference to the position of the wringer or centrifugal dryer.

A detachable cover should be made of strong enough material that it will withstand normal wear, should not be too heavy or clumsy, and should be snug fitting, as well as easy to remove and replace. Machines equipped with a rubber gasket about the rim edge of the tub or around the detachable cover rim, prevent the detachable cover from rattling when the machine is in operation. If the edge is reinforced with metal and the machine is equipped with a centrifugal dryer, the rattle may be very annoying during the operation of the dryer.

Special Features.—Before final selection is made, the prospective purchaser should weigh the special features of one washing machine against those of the other washing machines being considered. Some of the special features found on present-day washing machines include: automatic timers, gas or electric heaters under tubs (such heaters may affect the bottom of the tub and shorten the life of the machine), special controls, modernistic design, and distinctive features or differences in washing principle or water remover.

Instruction Book.—Suitable instruction should be furnished with the washing machine fully explaining it and giving directions for its operation and care.

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